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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,120	07/24/2003	Seung-Woo Lee	YOM-0042	3922

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EXAMINER

GOKHALE, SAMEER K

ART UNIT	PAPER NUMBER
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2673

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/627,120	Applicant(s) LEE, SEUNG-WOO	
	Examiner Sameer K. Gokhale	Art Unit 2673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Jung (US 5,828,368).

Regarding claim 1, Jung teaches a liquid crystal display comprising: a liquid crystal panel assembly including a plurality of gate lines, a plurality of data lines, and a plurality of pixels connected to the gate lines and the data lines (col. 3, line 8, a TFT LCD inherently includes the above mentioned elements);

a signal controller (Fig. 6, item 3, where the signal generator acts as the signal controller) receiving image data (it is inherent that Son's signal generator is receiving image data), a vertical synchronization signal (Col. 1, lines 13-14), a horizontal synchronization signal (Col. 1, lines 14-15), and a data enable signal (Col. 1, line 21) from an external device (it is inherent that these signals are coming from an external device), generating control signals used for driving the liquid crystal panel assembly (see col. 5, lines 11-15), counting the number of pulses of the horizontal synchronization signal from a pulse of the vertical synchronization signal to a subsequent pulse of the data enable signal (Fig. 5 and col. 4, lines 23-25 and lines 38-44, here the CPV pulses are synchronous with horizontal synchronization pulses so counting the CPV pulses is

equivalent to counting the horizontal synchronization pulses, and the blank data enable section starts with a vertical synchronization signal so counting from the start of a blank data enable section is equivalent to counting from a pulse of the vertical synchronization signal), and generating a vertical synchronization start signal (col. 2, line 8, the start pulse vertical signal is a vertical synchronization start signal) having a main-charging pulse in synchronization with the subsequent pulse of the data enable signal pulse (Fig. 5, where the main STV pulse is high when the data enable signal is high just after a blank period for the data enable signal) and a precharging pulse before the main-charging pulse (Fig. 5, where the pre-STV pulse is the precharging pulse);

a gate driver for activating the pixels based on the precharging pulse and the main-charging pulse (col. 2, lines 8-10);

and a data driver receiving the image data from the signal controller and writing the image data on the activated pixels (col. 1, lines 35-37, it is inherent that a data driver is the column electrode driver here).

Regarding claim 2, Jung teaches a liquid crystal display, wherein the precharging pulse is generated two clocks ahead of the main-charging pulse in case of 1-dot inversion (See fig. 5, where the pre-STV pulse is shown two clock pulses ahead of the main STV pulse).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jung in view of Nukiyama et. al. (US 6,600,469) (hereafter, "Nukiyama").

As discussed in the rejection to claim 1 above, Jung teaches all the claimed limitations, except that Jung does not teach a precharging pulse that is generated four clocks ahead of the main-charging pulse in case of 2-dot inversion, as presently recited in claim 3.

However, Nukiyama teaches a method for driving a liquid crystal display wherein a precharging pulse is generated four clocks ahead of the main-charging pulse in case of 2-dot inversion (col. 10, line 45-50).

Thus it would have been obvious to one in the ordinary skill in the art at the time of the invention to incorporate the teaching of Nukiyama in the method of Jung to be able to utilize the lower power consumption capabilities of a 2-dot inversion system.

5. Claim 4 - 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jung in view of Rabii (US 5,394,171).

Regarding claim 4, Jung teaches a method of driving a liquid crystal display, the method comprising:

setting count reference points for the vertical and the horizontal synchronization signals depending on the polarities of the synchronization signals (Fig. 5, and col. 2, line 38, here it is inherent that the count reference points depend on the polarities for the

vertical and the horizontal synchronization signals because it specifically corresponds to the falling edge of each of those signals);

determining whether a back porch of the vertical synchronization signal in a predetermined number of frames is maintained constant (see col. 3, lines 7-15, and see col. 4, line 61 through col. 5, line 6, here the BLANK section is the same as the back porch);

counting the number of the pulses of the horizontal synchronization signal from a pulse of the vertical synchronization signal if the back porch of the vertical synchronization signal is maintained constant (col. 4, lines 46-49, here counting the CPV pulses is equivalent to counting the pulses of the horizontal synchronization signal, and Jung's invention must therefore be counting the CPV pulses during a BLANK section with the generation of every pre-STV signal);

and generating a pulse of a vertical synchronization start signal if the counted number of the pulses of the horizontal synchronization signal reaches to a predetermined value (col. 5, lines 4-8, where the count value stored in memory is the predetermined value).

However, Jung does not teach a method for determining whether polarities of vertical and horizontal synchronization signals are positive or negative.

However, Rabii does teach a method for determining whether polarities of vertical and horizontal synchronization signals are positive or negative. (See col. 6, lines 39-41 and col. 11, lines 54-56).

Thus it would have been obvious to one in the ordinary skill in the art at the time of the invention to incorporate the teaching of Rabii in the method of Jung to be able to determine the polarity of the vertical and horizontal synchronization signals in order to know whether to check the rising edges or falling edges of each signal when setting up a clock pulse counter.

Regarding claim 5, Jung teaches a method wherein the predetermined value is equal to $(X - 2 \times R)$, where X is a count value when a pulse of the data enable signal is generated, and R is an inversion unit of dot inversion. (see col. 4, line 47-48, here it is inherent that Jung's method teaches the formula $X - 2R$ because the pre-STV signal is generated two CPV signals prior to the data enable signal, which corresponds to X, and R is equal to 1 here for the 1-dot inversion case).

Regarding claim 6, Rabii teaches a method of polarity determination that comprises:

counting a high section when a pulse indicating a rising edge of the vertical or the horizontal synchronization signal is generated (col. 18, line 37-39);

counting a low section when a pulse indicating a falling edge of the vertical or the horizontal synchronization signal is generated (col. 18, line 43-35);

and determining that the vertical or the horizontal synchronization signal is negative type if the counted number of the high section is larger than the counted number of the low section by comparing the counted values of the high section and the

low section (col. 18, line 64 to col. 19, line 1) and that the vertical or the horizontal synchronization signal is positive type if the counted number of the high section is smaller than the counted number of the low section by comparing the counted values of the high section and the low section (col. 18, line 57-59).

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jung in view of Rabii and in further view of Santou (US 6,879,321).

As discussed in the rejection to claim 4 above, Jung in view of Rabii teaches all the claimed limitations of claim 4. Additionally, Jung teaches a driving method wherein the counting reference points are falling edges of the vertical and the horizontal synchronization signals if the polarity of the vertical and the horizontal synchronization signals is positive type (see Fig. 5 where the number n is counted from the falling edge of the Vsync and Hsync signal).

However Jung does not teach a method where the counting reference points are rising edges of the vertical and the horizontal synchronization signals if the polarity of the vertical and the horizontal synchronization signal is negative type.

However Santou does teach that if the horizontal and vertical synchronization signals are of negative type polarity, then an edge detecting unit can look for the opposite values as it did for the case of positive type polarity (see col. 8, line 27-40).

Thus it would have been obvious to one in the ordinary skill in the art at the time of the invention to incorporate the teaching of Santou and Rabii in the method of Jung to

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check the horizontal and vertical synchronization signals for the opposite values as it did for positive type polarity in order to accommodate the case of negative type polarity.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chen (US 5,648,793) teaches a driving system for an active matrix LCD that performs pre-charging of a pixel and 1-dot inversion. Song et. al. (US 6,842,161) teaches an LCD driver for 1-dot and 2-dot inversion. Kategawa (US 2003/0193461) teaches an LCD driver that performs pre-charging of a pixel for 1-dot and 2-dot inversion cases. Son et. al. (US 6,693,618) teaches an LCD driving method that performs pre-charging of a pixel. Kanazawa (US 6,559,814) teaches a driving plasma display panel that performs counting from a falling edge of a vertical synchronization signal and a rising edge of a horizontal synchronization signal.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sameer K. Gokhale whose telephone number is (571) 272-5553. The examiner can normally be reached on M-F 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571) 272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SKG
October 6, 2005

Sameer Gokhale
Examiner
Art Unit 2673



JIMMY NGUYEN
PRIMARY EXAMINER